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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,171	01/04/2005	Jorkki Hyvonen	3501-1094	9230

466 7590 02/17/2010

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ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
02/17/2010	ELECTRONIC

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/520,171
Filing Date: January 04, 2005
Appellant(s): HYVONEN, JORKKI

01/26/2010
HYVONEN, JORKKI
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/16/2009 appealing from the Office action mailed 10/23/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 5377281	Ballard et al.	12-1994
US US 20020165873	Kwok et al.	11-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 15 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As per the claims, the language “loadable with a computer readable medium encoded with a computer program” do not transform the claimed subject matter into statutory subject matter. The recital is merely a field of use or desired end use limitation. A mathematical algorithm is not made statutory by "attempting to limit the use of the formula to a particular technological environment." Diehr, 450 U.S. at 191, 209 USPQ at 10. Thus, "field of use" or "end of use" limitations in the claim preamble are insufficient to constitute a statutory process.

Claim 15 directly recites a mathematical algorithm by setting forth the steps of:

“creating a trie structure…”

“receiving an input…”

"proceeding from the starting point…”

“calculating distances at the calculation point…”

“calculating distances at the calculation point also…”

“after the calculation has terminated, selecting…”

These steps are mathematical in nature.

Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are complex to analyze and are addressed herein.

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. Benson, 409 U.S. at 71-72, 175 USPQ at 676. Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

The claimed subject matter must contain more than 35 USC 101 judicial material, such as an application which involves the 101 subject matter. Particularly, there must be a result that is useful, tangible, and concrete. The claimed subject matter within claim 15 contains material that lack tangibility, where a real world result is produced. Examiner takes the position that the recited claim 15 is merely mathematical in nature, where the process of an apparatus "loadable with a computer readable medium encoded with a computer program" does not produce a tangible result. NOTE: "loadable", when read in light of the specification is NOT construed to be functionally equivalent and equally effective to loaded.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 8-11, 14, and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. A computer readable medium is not disclosed or supported within the specification of the present invention.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term “loadable”, when read in light of the specification does not allow one of ordinary skill in the art to determine the scope of the claim in view of such as term, and is therefore rendered indefinite. For the purposes of prior art, the term “loadable”, when read in light of the specification is NOT construed to be functionally equivalent and equally effective to loaded.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 8-11 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ballard et al US 5377281 A (herein after Ballard) in view of Kwok et al. US 20020165873 A1 (hereinafter Kwok).

Re claims 8, 15, and 16, Ballard teaches computer readable medium encoded with a computer program for executing a method for searching for an input symbol string (Col. 7 line 60 – Col. 8 line 52) among a set of symbol strings, comprising: creating a trie data structure (Fig. 4 & Col. 7 line 10-36) of symbol strings, wherein the symbol strings are grouped into branches in such a manner that the symbol strings beginning with the same symbols belong to the same branch (Col. 7 line 10-36), and the symbol strings in the same branch divide into new branches at the symbols (Col. 7 line 10-36), from which onwards the symbols strings differ from each other, receiving an input formed of an input symbol string, proceeding from the starting point of the trie data structure along a branch to a calculation point indicated by the next symbol (Fig. 4).

Calculating distances at the calculation point between a sample symbol string formed by the symbols of the calculation point of the branch in question and the calculation points preceding it and the input symbol string by comparing (Col. 7 line 60 – Col. 8 line 52) these in alternative ways (Col. 7 line 60 – Col. 8 line 52).

Selecting repeatedly the next branch to follow to the calculation point indicated by the next symbol (Fig. 6 & fig. 7), at which said calculation is repeated for the new

calculation point (Fig. 6 & fig. 7), said selection of the next branch being performed in such a manner that next the routine (Fig. 6 & fig. 7) proceeds from the calculation point, from which the lowest reference value has been obtained as result (Ballard fig. 6 & fig. 7).

After the calculation has terminated (Fig. 6 and fig. 7), selecting one or more symbol strings (Fig. 6 and fig. 7) having the shortest distance (Col. 9 lines 46-68) to the input symbol string on the basis of the performed calculations, and using the selected symbol string(s) (Ballard Col. 7 line 60 – Col. 8 line 52) to produce a response (Ballard fig. 5)

However, Ballard fails to teach calculating at the calculation point also the smallest possible length difference (Kwok [0062]) corresponding to each distance that indicates how much the length of the remaining part of the input symbol string not examined in the distance calculation differs from the lengths remaining in the symbols strings passing through the calculation point, and calculating on the basis of each distance and corresponding length difference a reference value (Kwok [0062]).

Kwok teaches an edit distance is a measure of "distance" between two words. It can be thought of as a measure of the similarity (or non-similarity) between two words. A simple measure of the edit distance is the number of characters that are different between two words. For example, the two words "cat" and "cot" differ in one character position, and the edit distance would therefore be one. Using this definition, a measure of edit difference could be determined through the following formula: (worst case edit

distance-edit distance)/worst case edit distance. In the latter example, this is (3-1)/3, or 2/3. Thus, as edit distance increases, the edit distance measure decreases.

Kwok also teaches an edit distance between a words "tame" and "lame" may be less than one, because it is likely that a writer simply did not cross the "t" in the word. Note that the edit distance measure in this case increases from that calculated in the example of the last paragraph. As another example, an edit distance between the words "man" and "can" may be larger than one, because it is unlikely that the characters "m" and "c" would be written in a confusingly similar manner.

Kwok teaches and admits that search routines of discourse is well known in the art, wherein Kwok in fact clearly teaches a rank-based keyword measure. The traditional text search, also called a simple keyword score, can be enhanced by including words other than the highest scoring word from the recognition stack generated by a recognition model. In a rank-based keyword measure, multiple words from a recognition stack are selected and ranked. For instance, the top three words from the recognition stack could be selected and weighted by rank: 1.0 for the top word; 0.2 for the second word; and 0.04 for the third word. New word scores are determined by multiplying the old word score by the weight. An "expanded" document is essentially created, which has three weighted alternative text words for each handwritten word. The system then searches through this expanded document for a single search term that corresponds to one word of the query stack. Each word of the query stack is used as the single search term until each word of the query stack has been used to search through the document. Illustratively, the document score is the sum of the rank weights

for each match, between a word in a query stack and a word in a document stack, in the expanded document. This document score will always be equal to or greater than the simple keyword document score. It should be noted that this is only one technique for creating a document score, and other techniques will be apparent to those skilled in the art (Kwok [0037]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Ballard to incorporate the smallest possible length difference indicating how much the length of the remaining part of the input symbol differs from the lengths remaining in the symbol string as taught by Kwok to allow for the ranking of the most probable data when comparing in input string to possible candidates in a trie, where various of a word can be discarded based on the edit distance and edit difference, wherein additionally, using a difference value can be used to further narrow a set of candidates through the use of probabilities such as the difference value divided by the worst possible difference present (Kwok [0037]).

Re claim 9, Ballard teaches a method as claimed in claim 8, comprising comparing the distance of the symbol string or strings used to produce the response (Fig. 6 & fig. 7) and that of the input symbol string with a predefined maximum distance (Col. 8 line 30-41), and changing the produced response to indicate that the input symbol string was not found if the distance exceeds the maximum distance (Ballard Col. 8 line 30-41 & fig. 6 & fig. 7)

Re claim 10 and 14, Ballard teaches a method as claimed in claim 8, comprising when selecting the branch (Col. 7 line 10-36 & fig. 4), comparing said lowest reference value with the predefined maximum distance (Fig. 6 & fig. 7), and terminating the calculation if the lowest reference value exceeds the maximum distance (Col. 9 lines 46-68 Fig. 6 & fig. 7)

Re claim 11, Ballard teaches a method as claimed in claim 8, comprising when selecting the branch, checking whether calculation is already done for the last calculation point on one of the branches distance (fig. 6 & fig. 7), and terminating the calculation, if it turns out that for the last calculation point of one of the branches a reference value has been obtained that is lower than the reference values obtained for all the other calculation points distance (Col. 9 lines 46-68 & fig. 6 & fig. 7).

(10) Response to Argument

This is in response to the appeal brief filed 11/16/2009 appealing from the Office action mailed 10/23/2008.

Re arguments directed to:

- **"Claim 15 is directed to statutory subject matter"** (Appeal Brief page

6).

After further consideration, Examiner believes that the phrase “An apparatus loadable with a computer readable medium encoded with a computer program” implies that the limitations recited in the claims are in fact mathematical algorithm limitations “loadable” onto a computer, that can be merely mathematical in nature, such as:

“creating a trie structure…”

“receiving an input…”

"proceeding from the starting point…”

“calculating distances at the calculation point…”

“calculating distances at the calculation point also…”

“after the calculation has terminated…”

, wherein a computer readable medium lacks support in the disclosure of the present invention, therefore rendering the “medium encoded with a computer program” to be merely a mathematical algorithm, wherein the apparatus itself is not necessarily performing the limitations in the claims. Further, Examiner believes that a "memory” is different than a computer readable medium, and does not perform the recited claim limitations. For instance, consider the only support for the use of a “medium” in the specification of the present invention describing cancelled claim 6 (prior to examination), “the data medium of independent claim 6” (present invention spec.). Further, memory being different from a medium, also lacks support to enable a statutory amendment to claim 15. Examiner finds that this is the only feasible support for a computer readable medium, and therefore Examiner can not confidently say that claim 15 is statutory.

Furthermore, Examiner may even construe a "medium" for example, to be a wire or cable with lack of support. For example, Examiner understands a processor or process performed by or in a computer system to be statutory, however due to the nature of the specification, Examiner finds it difficult to recommend a statutory amendment that can perform the limitations of claim 15 without being directed to a mathematical algorithm.

- **"Claims 8-11, 14 and 15 comply with 35 USC 112, first paragraph written description requirement"** (Appeal Brief page 7)**.**

After further consideration, Examiner believes that for the same reasons above, that these claims do not have proper support to be statutory. For instance, consider the only support for the use of a "medium" in the specification of the present invention describing cancelled claim 6, "the data medium of independent claim 6". Examiner finds that this is the only feasible support for a computer readable medium, and therefore Examiner can not confidently say that claims 8-11, 14 and 15 are statutory. Furthermore, Examiner can construe a "medium" for example, to be a wire or cable with lack of support. Therefore, since a "data medium" is no longer recited in the claim language, support for a "computer readable medium" is not present.

- **"Claim 15 complies with 35 USC 112, second paragraph"** (Appeal Brief page 8)**.**

After further consideration, Examiner believes that the term “loadable” is equivalent to “capable” and therefore not effective to “loaded”, wherein Examiner understands an apparatus to be “capable" of having a “computer readable medium encoded with a computer program” to be non statutory. As previously recited, the only support for the use of a “medium” in the specification of the present invention describing cancelled claim 6, “the data medium of independent claim 6”. Examiner finds that this is the only feasible support for a computer readable medium, and therefore Examiner can not confidently say that claim15 is statutory.

- “**Claim 8 requires that the length difference calculation indicates “how much the length of the remaining part of the input symbol string not examined in the distance calculation differs from the lengths remaining in the symbol strings passing through the calculation point”** “ (Appeal Brief page 10 paragraph 3).
- “**Rather, the claimed distance calculation is first performed (in calculation point P1 of Fig 2b, for example) to the beginning of the input symbol string “ABO" and the symbols in the trie structure “A" located before and at a calculation point ([section 0033], for example). The result of the distance calculation is: 2 After this, a length calculation is done (section [0033]) with the 2 more characters left in the input symbol string (“RD") which have so far not been**

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> **examined in the distance calculation. The length difference calculation is therefore done for these 2 characters and the 5 so far unexamined characters ("ACUS" and "OARD") of the symbol strings passing through the calculation point PI, so the length difference is: 5-2=3**" (Appeal Brief pages 10-11)**.**

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After further consideration, Examiner believes that Kwok in fact teaches as claimed, "how much the length of the remaining part of the input symbol string not examined in the distance calculation differs from the lengths remaining in the symbol strings passing through the calculation point". Examiner believes that Kwok gives a clear step that teaches that which is claimed by Applicant, such as paragraph [0062], wherein Kwok gives an example of an edit distance. Kwok explicitly recites "measure suitable for use with the present invention is an edit distance. An edit distance is a measure of "distance" between two words. It can be thought of as a measure of the similarity (or non-similarity) between two words. A simple measure of the edit distance is ***the number of characters that are different between two words***. For example, ***the two words "cat" and "cot" differ in one character position***, and the edit distance would therefore be one. Using this definition, a measure of edit difference could be determined through the following formula: (worst case edit distance-edit distance)/worst case edit distance. In the latter example, this is (3-1)/3, or 2/3."

In other words, Kwok takes into consideration the length of the string (i.e. 3), how different the string is (i.e. differing by 1), and finally the remaining letter/symbol left in the string (i.e. 2). Therefore, in view of the claim language, Examiner mathematically understands that the difference between "two" edit distances is equivalent to a length, such as the remaining elements in a string. Consider the algorithm taught by Kwok, where the first edit distance ***worst case edit distance*** is subtracted by the second ***edit distance*** to produce a length, or what Kwok refers to as a "***measure edit distance***" which would in fact be the remaining elements of a string that were not. Thus, the elements remaining in the string may have not in fact been considered in the distance calculation, wherein once a new string is disambiguated, the elements in the new string will be leftover, and may in fact be examined during another pass/calculation. Further, consider Fig. 2 of Kwok:

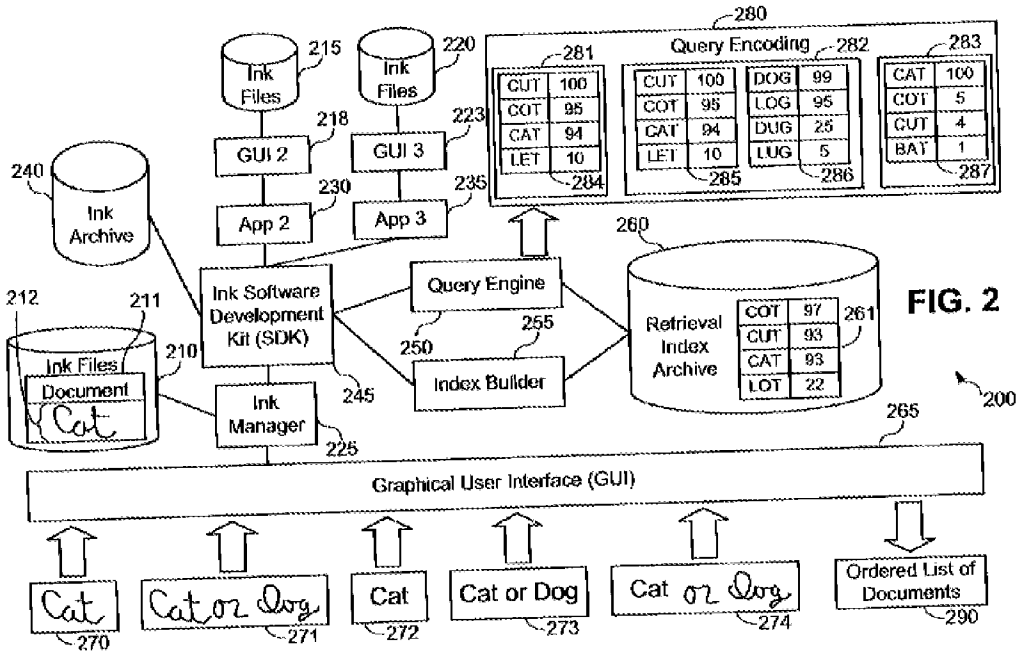

FIG. 2

Kwok demonstrates that several combinations exist in element 280 for example, that take into consideration from the beginning to the end of a string and can vary elements within a string. Consider that initially within the string “cat or dog”, fisrt "cut" is determined and secondly “dog” is determined, producing the “measure edit distance” of “cut or dog”. However, after a second pass, the output “measure edit distance” would produce the result of “cat or dog” which yields a higher score. Therefore, there will exist elements within a string that will remain until the smallest possible “measure edit distance” is found. Once again, by using the above equation described by Kwok (i.e. [worst case edit distance - edit distance] / worst case edit distance), one skilled in the art can find the difference in edit distances until the length difference (or “measure edit

distance"). As another final example, if a first and second resulting "measure edit distance" exists, than out of each of these results, the remaining unexamined elements will be evaluated against one another to produce a third "measure edit distance" with a higher score (i.e. smallest difference). Therefore, Examiner believes the claim language "how much the length of the remaining part of the input symbol string not examined in the distance calculation differs from the lengths remaining in the symbol strings passing through the calculation point" to be consistent with Kwoks teaching of a "measure edit distance".

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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